THAT WHICH IS CLAIMED IS:

1. A method of partitioning endogenous cellular mRNA-protein (mRNP) complexes, comprising:

contacting a biological sample comprising a mRNA-protein (mRNP) complex with at least one ligand that specifically binds at least one component of the mRNP complex;

separating the mRNP complex by binding the ligand with a binding molecule specific for the ligand, wherein the binding molecule is attached to a solid support; and then

collecting the mRNP complex by removing the mRNP complex from the solid support.

2. The method according to Claim 1, wherein the biological sample comprises a cell culture or a cell extract.

3. The method according to Claim 1, wherein the biological sample comprises whole tissue.

4. The method according to Claim 1, wherein the biological sample comprises a whole organ.

5. The method according to Claim 1, wherein the biological sample comprises a tumor.

6. The method according to Claim 1, wherein the biological sample comprises a tumor cell or a tumor cell extract.

7. The method according to Claim 1, wherein the biological sample comprises a population of neurons.

8. The method according to Claim 1, wherein the ligand is an antibody.

9. The method according to Claim 1, wherein the ligand is an antibody isolated using the serum of a subject with cancer.

10. The method according to Claim 1, wherein the ligand is an antibody isolated using the serum of a subject with an autoimmune disorder.

11. The method according to Claim 1, wherein the binding molecule is an antibody.

12. The method according to Claim 1, wherein the binding molecule is selected from the group consisting of Protein A, Protein G, and streptavidin.

13. The method according to Claim 1, wherein the component of the mRNP complex is nucleic acid.

14. The method according to Claim 1, wherein the component of the mRNP complex is RNA.

15. The method according to Claim 1, wherein the component of the mRNP complex is mRNA.

16. The method according to Claim 1, wherein the component of the mRNP complex is mature mRNA.

17. The method according to Claim 1, wherein the component of the mRNP complex is a RNA-binding protein.

18. The method according to Claim 1, wherein the component of the mRNP complex is a RNA-associated protein.

19. The method according to Claim 18, wherein the RNA-associated protein associates with the mRNP complex with a Kd of about 10^{-6} to about 10^{-9}.

20. The method according to Claim 18, wherein the RNA-associated protein associates with the mRNP complex with a Kd of about 10^{-7} to about 10^{-9}.

21. The method according to Claim 18, wherein the RNA-associated protein associates with the mRNP complex with a Kd of about 10^{-8} to about 10^{-9}.

22. The method according to Claim 1, wherein the component of the mRNP complex is selected from the group consisting of carbohydrates, lipids, and vitamins.

23. The method according to Claim 1, further comprising identifying the mRNA bound within the mRNP by separating the mRNA from the mRNP complex, obtaining a cDNA of the mRNA and then sequencing the cDNA.

24. The method according to Claim 23, wherein said identifying is carried out on a cDNA microarray.

25. The method according to Claim 1, wherein the ligand is an ELAV/Hu protein selected from the group consisting of HuA, HuB, HuC and HuD.

26. The method according to Claim 1, wherein the ligand is an antibody specific for at least one component of the mRNP complex, and the mRNP complex is separated by immunoprecipitation.

27. The method according to Claim 1, wherein a plurality of ligands is contacted with the biological sample to isolate a plurality of mRNP complexes.

28. The method according to Claim 1, further comprising cross-linking the mRNP complex prior to contacting the mRNP complex with the ligand.

29. The method according to Claim 1, further comprising cross-linking the ligand with the mRNP complex after contacting the mRNP complex with the ligand.

30. A method of isolating a protein that binds or associates with a mRNP complex, comprising:

obtaining a cDNA from a RNA of interest;

ligating the cDNA to a tagging DNA that encodes a binding partner for a ligand when the tagging DNA is expressed in a cell;

expressing the cDNA and the tagging DNA in a cell to produce a RNA fusion molecule comprising the binding partner for the ligand;

contacting a lysate of the cell with the ligand, wherein the ligand is attached to a solid support and binds the binding partner, thereby attaching the RNA fusion molecule to the support ;

collecting the RNA fusion molecule by separating the molecule from the support; and then

separating any protein that has bound or associated with the RNA of interest.

31. The method according to Claim 30, further comprising identifying the protein that has bound or associated with the RNA of interest.

32. A method of generating a gene expression profile of a cell *in vivo*, comprising:

partitioning a plurality of mRNP complexes from the cell according to Claim 1;

isolating the mRNP complexes, wherein the mRNA bound to each mRNP comprises a subset of the mRNA of the cell; and then

identifying the mRNAs of each subset, whereby the gene expression profile of the cell comprises the presence of each subset of mRNA and the identities of each subset of mRNA.

33. A method of screening a test compound for its ability to modulate gene expression in a cell, comprising:

generating a first gene expression profile of a cell according to the method of Claim 32, wherein the cell has been contacted with a test compound;

generating a second gene expression profile of a cell according to the method of Claim 32, wherein the cell has not been contacted with the test compound; and then

observing the difference, if any, between the first and second gene expression profile, the presence of a difference between the first and second gene expression profile indicates that the test compound can modulate gene expression in the cell.